

# PATENT ABSTRACTS OF JAPAN

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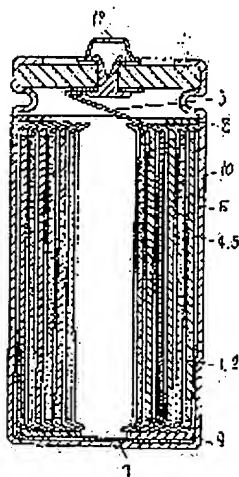
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## (54) NONAQUEOUS-ELECTROLYTE SECONDARY BATTERY

(57)Abstract:

PURPOSE: To obtain a battery maintaining high energy density and having improved cycle characteristic and little self-discharge and capacity deterioration after storage by using a specific positive electrode material.

CONSTITUTION: A secondary battery is constituted of a positive electrode mix 1, a lithium metal 4 and a separator 6 and the like. The positive electrode material is a lithium composite oxide expressed by a chemical formula  $\text{LiMO}_z$  ( $1.9 < Z < 2.1$ ), part of lithium is substituted with an alkaline earth metal, and M is one or more among cobalt, iron and nickel. When this positive electrode material is used, the



alkaline earth metal exists in the crystal lattice even if lithium ions are removed by 0.4 electron/metal or above during charging, thus the stable crystal lattice is formed. The cycle deterioration ratio is small in the charge/discharge cycle, and the self-discharge and capacity deterioration after high-temperature storage in the charged state are reduced.